CHAPTER 12
Glossary and References

Glossary

Acid Rain: Rain with a pH of 4.5 or less.

Aerobic: Life or processes that depend on the presence of oxygen.

Aggrading Stream Reach: Deposition is greater than erosion within the stream reach.

Algae: Green plants that occur as microscopic forms suspended in water (phytoplankton), and as unicellular or filamentous forms attached to rocks and other substrates. These plants lack roots, stems, flowers, and leaves, live mainly in water and use the sun as an energy source.

Algal Bloom: A sudden increase in the abundance of suspended (planktonic) algae, especially at or near the water surface, producing a green appearance to the water. Excess nutrient can cause an algal bloom.

Alkalinity: A measure of water's ability to neutralize acid.

Ampoule: A sealed bulbous glass tube that contains a liquid product. Ampoules are used in the orthophosphate and dissolved oxygen field kits.

Anaerobic: Life or processes that occur in the absence of oxygen.

Anaerobic Decomposition: The breakdown of organic material without oxygen.

Anoxia: A condition of no oxygen in the water. Often occurs near the bottom of eutrophic, stratified lakes in summer, under ice in winter.

Aquatic Community: All the groups of plants and animals occupying a common body of water.

Banks: The portion of the stream channel which restricts the movement of water out of a channel during times of normal water depth. This area is characterized as being the exposed areas on either sides of the stream above water's level.

Baseline: A level or concentration that is the norm.

Baseflow: That portion of stream flow originating from groundwater discharging into the stream.

Basin: Another name for a watershed.

Benthic Zone: The zone on the bottom of moving or standing waters.

Bioaccumulation: The build-up of toxic substances in animal flesh.

Biodiversity: Biological diversity in an environment as indicated by numbers of different species of plants and animals.

Biomass: Living things and their byproducts.

Canopy Cover: Overhanging vegetation that provides shade to a stream.

Carrying Capacity: The number of individuals the resources of a given area can support.

Channelization: The straightening of streams by eliminating the meanders or bends. A channelized stream resembles a ditch with few or no meanders.

Chemical Weathering: Erosion caused by chemical reactions (e.g., rainwater dissolving limestone).

Chlorophyll: Green pigments found in plants which are necessary for photosynthesis; may be used as an indicator of algal population levels in a stream or lake.

Confined Aquifer: An aquifer that is protected by an impervious layer of rock.

Cultural Eutrophication: The accelerated enrichment of waters due to human activities. Excess nutrients from agricultural runoff, sewage, or other sources allow waters to support a higher amount of plant and animal matter than they would naturally.

Dead Zone: An area of the Mississippi River delta that cannot support aquatic life during certain times of the year due to low dissolved oxygen levels.

Degrading Stream Reach: A stream reach where erosion is greater than deposition.

Denitrification: The process of converting nitrate nitrogen into nitrite nitrogen (NO_2^-), which can convert to nitrogen gas (N_2) and escape into the atmosphere.

Discharge, Flow: A measure of how much water passes a given point in a given time (m^3/s).

Discharge Permits: The maximum amount of a pollutant that an entity is permitted to release into a water body.

Dissolved Oxygen: The amount of oxygen dissolved in water. Higher amounts of oxygen can be dissolved in colder waters than in warmer waters. Dissolved oxygen is necessary to support fish and other aquatic organisms.

Diversity: Having a large variety of organisms.

Dysotrophic: Low in nutrients, highly colored with dissolved humic organic matter.

Ecology: The study of relationships among living and nonliving things.

Ecoregion: Large areas within which local ecosystems reoccur in a more or less predictable patterns. Ecoregions provide a spatial framework for ecosystem assessment, research, inventory, monitoring, and management.

Ecosystem: A community of animals, plants, and microorganisms interacting within the physical and chemical environment.

Embeddedness: The degree that larger particles (boulders or gravel) in a stream are surrounded or covered by fine sediment.

Emergent Vegetation: Plants living along the edges (or banks) of a stream that are rooted in sediment but grow above the water's surface.

Ephemeral Stream: A stream that flows during the wet season and is dry in the dry season.

Erosion: The wearing down and removal of soil, rock fragments and bedrock through the action of running water, wind, moving ice, and gravitational creep (or mass movement).

E. coli (Escherichia coli)*:* A bacterium of the intestines of warm-blooded organisms, including humans, that is used as an indicator of water pollution for disease causing organisms.

Eutrophic: A term used to describe very productive or enriched lakes. These lakes tend to exhibit some or all of the following characteristics: an abundance of rooted plants; elevated turbidity levels due to high algal populations; loss of oxygen in bottom waters during the summer months; rapid accumulation of soft bottom sediments; and abundant fish, which may include stunted and/or rough species in the most fertile lakes.

Eutrophication: A gradual increase in the productivity of a lake ecosystem due to enrichment with plant nutrients, leading to changes in the biological community as well as physical and chemical changes. This is a natural process, but can be greatly accelerated by humans (see cultural eutrophication).

Fecal Coliform Bacteria: The portion of the coliform group which is present in the gut or feces of warm-blooded organisms. The presence of fecal coliform bacteria in water is an indication of pollution and potential human health problems.

Filamentous: Cells, recognizable as attached, hair-like growths, often appearing as waving strands in the water.

Floodplain: An area on both sides of a stream where flood waters spread out during high rains. The surface may appear dry for most of the year, but it is generally occupied by plants adapted to wet soils.

Flow, Discharge: A measure of how much water passes a given point in a given time (m^3/s).

Gaining Stream: A stream that receives its baseflow from the groundwater system.

Geographic Information System: A mapping application that uses different overlaid layers of information to represent the Earth surface.

Geography: Study of land (what it looks like, what it's used for, etc.), the things living there, the people (who they are and what they do), how all of these things interact with each other, and where they are located.

Geology: The study of Earth's history, the materials that make up the earth, and the processes that act on the earth.

Glacial Till: Unsorted material deposited by a glacier.

Groundwater: Water found beneath the earth's surface.

Habitat: The place where a plant or animal lives, which has all of the conditions necessary to support its life and reproduction.

Habitat Diversity: The range of habitats within a region.

Hydrogeology: The effect geology has on water quality and stream morphology.

Hydrologic Unit Codes (HUC): A measurement of watersheds that indicates size and location of particular watersheds; a watershed address.

Hydrologic Cycle: The continuous movement of water among the oceans, air, and the earth in the form of precipitation, percolation, evapotranspiration, and stream discharge.

Hydrology: How water flows on top of, and below, the Earth's surface.

Hypereutrophic: Murky, highly productive waters, closest to the wetlands status. Many clearwater species cannot survive.

Hypoxia: Low dissolved oxygen levels in a water body that can result from the decay of plants and algae.

Immobilization: The process of converting usable, inorganic forms of nitrogen into unusable, organic forms.

Impervious: Water cannot pass through; waterproof.

Indicator Species: Groups or types of organisms used to assess the environmental health of a water body.

Infiltration Rate: The rate at which water soaks into the soil.

Inorganic: Any compound not containing carbon.

Intermittent Stream: A stream that flows when there is adequate precipitation and is dry when there's not. The stream does not flow continuously.

Lake: A large body of water that has water all year long.

Lake Turnover: The circulation of the entire water column that occurs in spring and autumn when the thermocline is eliminated.

Leaf Litter: Plants and plant parts that have recently fallen and are partially or not at all composed.

Leaf Pack: Any cluster or gathering of leaves and organic debris normally found on the edges of streams, or found washed up on the upstream side of large rocks, fallen trees or logs in the stream.

Left Bank: When facing upstream, the bank to your left.

Lentic Water: Standing water, such as lakes, ponds and wetlands.

Limiting Resource: A resource that limits the abundance of an organism.

Loamy soil: Material composed primarily of sand and silt particles with some clay present.

Losing Stream: A stream that loses flow to the groundwater system.

Lotic Water: Flowing water, such as rivers and streams.

Meander: A bend in a stream.

Mesotrophic: A term used to describe lakes which are moderately productive. These waters contain more nutrients and, therefore, more biological activity.

Metamorphosis: A series of changes in body structure (form) from egg to adult.

Methemoglobinemia: The presence of methemoglobin in blood is caused by poisoning by certain substances, such as nitrate. Young babies (less than 6 month) are particularly susceptible to methemoglobinemia, leading to a condition known as "blue baby syndrome" which if untreated can cause death.

Microhabitat: Local conditions which immediately surround an organism. Microhabitats include algae mats, leaf packs, logjams, rock piles, root wads, undercut banks, and weed beds.

Mineralization: The process of decomposition and transformation of organic nitrogen found in plant parts and animal manure into available forms of inorganic nitrogen.

Niche: The function or position of an organism or population within an ecological community or the particular area within a habitat occupied by an organism.

Nitrate: A form of nitrogen. Nitrate is water soluble and is the most common form of nitrogen found in streams and lakes.

Nitrogen: An element necessary for the growth of aquatic plants; may be found in several forms, including nitrates, nitrites, and ammonia. Nitrogen is considered to be limiting because it is needed by plants and animals in the stream in moderate amounts. When present in higher amounts, such as large amounts of fertilizer runoff from local farm fields or urban lawns, large algal blooms occur which can result in a depletion of dissolved oxygen.

Nitrogen Cycle: The uptake of inorganic nitrogen by plants that convert it to organic forms, which are used by animals and transformed back into inorganic nitrogen by bacteria.

Nitrification: The process of converting ammonium nitrogen into nitrate nitrogen.

Nonpoint Source Pollution: A type of pollution whose source is not readily identifiable as any one particular point, such as pollution caused by runoff from streets, agricultural land, construction sites, and parking lots. Polluted runoff and pollution sources not discharged from a single point.

Nutrient: Any of a group of elements necessary for the growth of living organisms, such as nitrogen and phosphorus. Excess supplies of phosphorus or nitrogen, however, may enhance plant growth in surface waters.

Nutrient Enrichment: Elevated levels of nitrogen and/or phosphorus in a water body that result in nuisance growth of algae or other aquatic plants.

Organic Matter: Decomposing plant and animal material.

Organic Phosphate: Phosphates that are found in plant and animal tissue, waste solids, or other organic matter.

Orthophosphate: Inorganic form of phosphorus.

Oxbow Lake: Lake formed when a river meander is completely cut off from the river.

Pathogen: An organism capable of causing disease.

Pathogenic: Capable of causing disease.

Perennial Stream: Stream that flows nearly all year long.

Periphyton: Organisms attached to or clinging to the stems and leaves of plants or other objects projecting above the bottom of sediments of freshwater ecosystems. This may be in the form of algae attached to large rocks. Tiny plants and animals living on surfaces below water.

Perennially Pooled Conditions: Intermittent streams may cease to flow from year to year, but those that don't dry up completely often maintain pools of water throughout the year.

Pervious: Allows water to pass through.

Pesticides: A pesticide is any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest. Though often misunderstood to refer only to insecticides, the term pesticide also applies to herbicides, fungicides, and various other substances used to control pests.

pH: A measure of acidity or alkalinity on a scale of 0 to 14. A pH of 7 is neutral, less than 7 is acidic, and greater than 7 is alkaline (basic).

Phosphorus: An element necessary for the growth of aquatic plants. Elevated levels of phosphorus can affect water quality by increasing the production of algae and rooted plants. This can lead to eutrophication of water bodies.

Phosphorus Cycle: The process of orthophosphate being converted to organic phosphate when it used by plants and animals and being converted back to inorganic phosphate and recycled when they die and decay.

Photosynthesis: The process by which green plants produce oxygen from sunlight, water, and carbon dioxide.

Physical Weathering: Erosion caused by mechanical forces (e.g., water expanding as it freezes and breaking apart rocks).

Phytoplankton: Algae that are microscopic and suspended in water.

Plankton: The community of microorganisms consisting of plants (phytoplankton) and animals (zooplanton) inhabiting open-water regions of lakes and rivers.

Point Sampling: Sampling from a specific depth, or point, in the lake water column.

Point Source Pollution: Pollutants originating from a "point" source, such as a pipe, vent, or culvert.

Point Source Contamination: Contamination stemming from a single, isolated source, such as a drainpipe or an underground storage tank.

Pollution: An undesirable change in the environment, usually the introduction of abnormally high concentrations of hazardous or detrimental substances, such as nutrients or sediment. The presence of any substance that harms the environment.

Pollution Sensitive Organisms: Organisms that cannot withstand the addition of pollution to their aquatic environment.

Pollution Tolerant Organisms: Organisms that can withstand polluted environments.

Pond: Body of water that has water in it year round, but that is smaller than a lake.

Pool: That portion of a stream that is deep and slow moving. Often follows a riffle area.

Producers: Organisms that produce their own food through photosynthesis.

Recharge Areas: Areas that allow surface water to infiltrate and recharge groundwater.

Respiration: Oxygen consumption.

Riffle: That portion of a stream that is shallow and fast moving. An area of the stream where shallow water flows swiftly over completely or partially submerged rocks or other debris.

Right Bank: When facing upstream, the bank to your right.

Riparian Zone: An area, adjacent to and along a watercourse, which is often vegetated and constitutes a buffer zone between the nearby lands and the watercourse. The natural plant community adjacent to a stream.

Riprap: Any material (such as concrete blocks, rocks, car tires, or log pilings) that is used to protect or stabilize a stream bank from erosion.

Row Cropping: A method of farming used in the production of corn and beans.

Run: A stream habitat type characterized as having a moderate current, medium depth, and a smooth water surface.

Runoff: Water from rain, snowmelt, or irrigation that flows over the ground surface and runs into a water body.

Sanitary Sewer: A pipe that carries food and human wastewater to a municipal sewer system or a septic system.

Stormwater Sewer: A pipe that transports stormwater and meltwater runoff from roads and parking lots to streams and lakes. Stormwater sewers rarely lead to any type of treatment facility – the water is piped directly to streams and lakes.

Secchi Disc: A device used to measure the depth of light penetration in water.

Sediment: Eroded soil particles (soil, sand, and minerals) transported by water.

Sedimentation: The process by which soil particles (sediment) enter, accumulate, and settle to the bottom of a water body. The addition of soils to lakes or streams.

Sewage algae: A slimy matrix of bacteria, fungi and protozoa that form extensive cotton-wool-like plumes of white, grey, black or brown filamentous mats.

Silt: Fine particles of soil and minerals formed from erosion of rock fragments that accumulate on the bottom of stream, rivers, and lakes.

Siltation: The process of silt settling out of water and being deposited as sediment.

Slope: Change in elevation over a given distance.

Stable Stream Reach: A stream segment where sediment deposition is equal to erosion (i.e., no net gain or loss of sediment within the reach).

Streambed: The bottom of a stream where the substrate and sediments lay.

Stream Bank: The sides of the stream that contain the flow, except during floods.

Stream Depth: A measurement of the depth of a stream from the water's surface to the stream bed.

Stream Energy: Erosion potential of a stream.

Stream Flow: The amount of water moving in a stream in a given amount of time.

Stream Morphology: The shape of a stream.

Stream Order: Stream classification system.

Stream Reach: A specified length of stream.

Stream Transect: An imaginary line drawn from water's edge to water's edge, perpendicular to the flow of the stream.

Substrate: The surface upon which an organism lives or is attached. The material making up the bottom of the streambed.

Suspended Load: Sediment that is transported in suspension.

Thermal Pollution: The raising of water temperatures by artificial means that interferes with the functioning of aquatic ecosystems. Sources of thermal pollution include removal of trees along streams, introduction of cooling water from power plants or other industrial facilities, or runoff from hot paved surfaces to a water body.

Tile Lines: Drainage pipes used to remove water from an area.

Tolerant Species: An organism that can exist in the presence of a certain degree of pollution.

Topographic Map: A map representing the surface features of a particular area. Features illustrated include streams, lakes, roads, cities, and elevation.

Topography: What the surface of the earth looks like.

Total Coliform Bacteria: A group of bacteria that are used as an indicator of drinking water quality. The presence of total coliform bacteria indicates the possible presence of disease-causing bacteria.

Transparency: The measure of water clarity. Transparency is affected by the amount of material suspended in water (i.e., sediment, algae, and plankton).

Trophic status: The level of growth or productivity of a lake as measured by phosphorus content, algae abundance, and depth of light penetration.

Turbidity: The presence of sediment in water, making it unclear, murky or opaque.

Universal Transverse Mercator (UTM): A grid system which divides the globe into 60 north-south zones, each covering a strip 6° wide in longitude. In each zone, coordinates are measured north and east in meters. The coordinates, known as UTM coordinates, are made up of one 6-digit X number and one 7-digit Y number, which describe how far north the point is from the equator and how far east it is from the next zone to the west.

Velocity: The speed at which water moves.

Vertical Stratification: Inadequate mixing of water in a water body.

Water Cycle: The continuous circulation of water in systems throughout the Earth involving condensation, precipitation, runoff, evaporation, and transpiration.

Water Ecology: The study of aquatic environments and the relationships among the living and nonliving things associated with those environments.

Water Quality: The condition of the water with regard to the presence or absence of pollution.

Watershed: A region or area of land that drains into a body of water such as a lake, river, or stream.

Wetland: Shallow body of water that may not have water in it year round.

Zooplankton: Microscopic animals.

References

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